

# PATENT ABSTRACTS OF JAPAN

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(54) RECORDING APPARATUS AND RECORDING METHOD

(57)Abstract:

PROBLEM TO BE SOLVED: To record both the motion picture data and still image data in a mode reproducible by various reproduction apparatuses.

SOLUTION: The apparatus performs data compression for the motion picture data by the MPEG system in a MPEG encoder 2 forms data for recording corresponding to a predetermined recording format in a format-forming part 3 and records them in a DVD 100; performs data compression for the still image data

by the JPEG system in a JPEG encoder 6 and records in the DVD 100 separately from the motion picture data. The apparatus reads the still image data compressed by the JPEG system and recorded in the DVD 100, converts them into an I picture of the MPEG system in a format converter 7 and records them in the DVD 100 in the predetermined format through the format-forming part 3.

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## CLAIMS

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[Claim(s)]

[Claim 1]

A reading means which reads digital still picture information of one or more sheets recorded on a predetermined recording medium in a digital still picture format to predetermined timing

A conversion method which changes this into data for record corresponding to a digital animation format as gathers said digital still picture information of one or more sheets from said reading means

A recording device which records said data for record formed in said conversion method on said recording medium

A recorder characterized by preparation \*\*\*\*\*.

[Claim 2]

It is the recorder according to claim 1

When both digital dynamic image data of said digital animation format and digital both [ one side or ] of said digital still picture format are recorded on said recording medium, said recording device A recorder recording said data for record from said conversion method on said recording medium as data currently recorded previously is not extinguished.

[Claim 3]

It is the recorder according to claim 1 or 2

A receiving means which receives an input of information which directs a reproduction mode of a still picture of one or more sheets which was used as

data for record corresponding to said digital animation format and was recorded on said recording medium

An alteration means which changes information about reproduction about said still picture of one or more sheets which were used as data for record corresponding to said digital animation format based on information received through said receiving means and were recorded on said recording medium

A recorder characterized by preparation \*\*\*\*\*.

[Claim 4]

They are claim 1 and the recorder according to claim 2 or 3

Photography with video and a still picture is enabled video and a still picture which were photoed are used as digital data and it is a camera part in which an output is possible

An animation conversion method which changes digital dynamic image data from said camera part into said digital animation format

A still picture conversion method which changes digital still picture information from said camera part into still picture information of said digital still picture format

A preparation

A recorder wherein said recording device can record dynamic image data considered as said digital animation format from said animation conversion method and said still picture information considered as said digital still picture format from said still picture conversion method on said recording medium.

[Claim 5]

A read-out step which reads digital still picture information of one or more sheets recorded on a predetermined recording medium in a digital still picture format to predetermined timing

A converting step which changes this into data for record corresponding to a digital animation format as gathers said digital still picture information of one or more read sheets

A record step which records said data for record on said recording medium

A \*\*\*\*(ing) record method.

[Claim 6]

It is the record method according to claim 5

In said record step when both digital dynamic image data of said digital animation format and digital both [ one side or ] of said digital still picture format are recorded on said recording medium A recorder recording said data for record formed in said converting step as did not extinguish data currently recorded previously on said recording medium.

[Claim 7]

It is the record method according to claim 5 or 6

A reception step which receives an input of information which directs a reproduction mode of a still picture of one or more sheets which was used as data for record corresponding to said digital animation format and was recorded on said recording medium

A change step which changes information about reproduction about said still picture of one or more sheets which were used as data for record corresponding to said digital animation format based on information received in said reception step and were recorded on said recording medium

A \*\*\*\*(ing) record method.

[Claim 8]

They are claim 5 and the recorder according to claim 6 or 7

A photography step which photos video or a still picture and outputs photoed video or a still picture as digital data

An animation converting step which changes into dynamic image data of said digital animation format digital dynamic image data of video photoed in said photography step

A still picture converting step which changes into still picture information of said digital still picture format digital still picture information of a still picture photoed in said photography step

A shot data record step which records said still picture information formed in said

dynamic image data formed in said data formation step or said still picture converting step on said recording medium  
A \*\*\*\*(ing) record method.

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

#### [Field of the Invention]

This invention uses recordable DVD (Digital Versatile Disk) etc. as a recording medium for example it is related with the record method used with recorders such as a digital camcorder or a digital camera etc. which record video and a still picture on this as digital data and such a recorder.

[0002]

#### [Description of the Prior Art]

In recent years the digital camcorder using the mass disk recording medium of DVD etc. is considered as a recording medium. Also in the digital camcorder using such a disk recording medium not only video but a still picture has the high demand given to recording separately from video and making it like to be able to use the both.

[0003]

However when recording in the digital animation format considered for recording animations when video was conventionally recorded on a disc medium and recording a still picture on a disc medium what is recorded in the digital still picture format considered for still picture record is performed. however a recording format which is different in video and a still picture respectively -- in recording on the same disk recording medium and reproducing this the decoder corresponding to each of the recording format is needed.

[0004]

If the case where DVD is used is made into an example as a disk recording medium and it explains in recording video as a data compression system. MPEG (Moving Picture.) The digital animation format of DVD format video (DVD Video Format) a DVD video recording format (DVD Video Recording Format) etc. using an Experts Group method will be used.

[0005]

In recording a still picture as a data compression system. . For example used the JPEG (Joint Photographic Experts Group) method. The digital still picture format called a JPEG format a DCF (Design rule for Camera File system) format etc. will be used.

[0006]

Thus both dynamic image data and still picture information are reproduced from the recording medium currently recorded by the recording format from which dynamic image data and still picture information differ. When obtaining the video and still picture it must stop having to carry both the decoder for dynamic image data (MPEG decoder) and the decoder for still picture information (JPEG decoder).

[0007]

Therefore in reproducing the recording medium currently recorded by the compression format from which dynamic image data and still picture information differ with the playback apparatus which carries only the decoder for animations. It becomes impossible to reproduce about the still picture information currently recorded on the recording medium concerned but to use a still picture.

[0008]

For this reason about dynamic image data in a digital animation format make it record on a recording medium and about still picture information. It is possible to make it record in an MPEG stream and to record on it also about still picture information using what is called the private packet (Private Packet) etc. that are specified in the MPEG system as a digital animation format is mixed.

[0009]

However in reproducing the still picture information which was carried out in this way and recorded the MPEG decoder for exclusive use which can decode the private packet in an MPEG stream as still picture information is needed.

Therefore the decoder for animations for exclusive use which can be decoded is needed by using a private packet as still picture information and the still picture decoder cannot say a general-purpose solution although it becomes unnecessary.

[0010]

For example as indicated to the patent documents 1 (JP2002-325227A public relations) The method which creates a refreshable recording medium with the playback equipment general-purpose so to speak which does not support a digital still picture format in the still picture information which was photoed by the digital still camera and recorded on semiconductor memory etc. in the digital still picture format is also considered.

[0011]

Even if it is the still picture information recorded on the recording medium in the digital still picture format by using the art indicated to these patent documents 1 By changing this into I picture (Intra-Picture) of an MPEG system and recording in a digital animation format it is possible in playback apparatus provided with the MPEG decoder to create the recording medium which can use still picture information.

[0012]

[Patent documents 1]

JP2002-325227A public relations

[0013]

[Problem(s) to be Solved by the Invention]

However the art indicated to the patent documents 1 mentioned above is applied in an available mode also by various playback apparatus which there is not and already exists to a general user such as newly purchasing the recording and reproducing device provided with the conversion function to the digital animation format from a digital still picture format or record reproduction

apparatus. Offer of the art which records both dynamic image data and still picture information on a recording medium is desired.

[0014]

Thenwhen photoing a still picture using a digital camcorderit is possible to use form of I picture of an MPEG system from the startand to record still picture information on a recording medium. Howeverthe problem of distinction with the recording area of the still picture information made into the recording area of dynamic image data and the form of I picture arises so that it may not mix up with I picture of the usual video in this case. This is considered [ that the problem of use of still picture information and the various processings for management being complicatedor effective use of a recording medium falling victim to some extent may ariseand ].

[0015]

Generally the resolution of a digital still picture format is higher in the resolution of a digital animation formatand the resolution of a digital still picture format. For this reasonwhen it is made to record on a recording medium in a digital animation format from the start also about a still picture. The still picture information of a digital still picture format will not exist anywhereand it will become impossible to use still picture information in original resolution also in playback apparatus provided with the decoder of the still picture information of a digital still picture format.

[0016]

When DVD was used as a recording mediumas it also mentioned aboveas a recording format of DVDThere are DVD format video (DVD Video Format)a DVD video recording format (DVD Video Recording Format)etc.Even if it is a case where which recording format is usedthere is also a demand that it is made to like to be able to record both dynamic image data and still picture information that there is no restriction as possible.

[0017]

In view of the above thingthis invention sweeps away the above-mentioned



problem and an object of an invention is to provide the recorder which enables it to record both dynamic image data and still picture information in a refreshable mode with various playback apparatus and a record method.

[0018]

[Means for Solving the Problem]

In order to solve an aforementioned problem it is a recorder of the invention according to claim 1

A reading means which reads digital still picture information of one or more sheets recorded on a predetermined recording medium in a digital still picture format to predetermined timing

A conversion method which changes this into data for record corresponding to a digital animation format as gathers said digital still picture information of one or more sheets from said reading means

A recording device which records said data for record formed in said conversion method on said recording medium

A recorder characterized by preparation \*\*\*\*\*.

[0019]

According to this recorder according to claim 1 still picture information of one or more sheets recorded on a predetermined recording medium in a digital still picture format It is read to predetermined timing and this is summarized by a conversion method and it is changed into data of a digital animation format and is recorded on the same recording medium with which still picture information was read by recording device. That is still picture information is recorded on a recording medium also in a digital still picture format or a digital animation format.

[0020]

Thereby also in playback apparatus provided only with a decoder of a digital animation format it can be made to perform use of a still picture recorded on the recording medium concerned. In playback apparatus provided also with a decoder of a digital still picture format it can be made to perform use of a still picture with sufficient resolution using still picture information of a digital still

picture format as it is.

[0021]

[Embodiment of the Invention]

Hereafter the 1 embodiment of this invention is described referring to a figure. In the embodiment described below the case where the recorder by this invention and a record method are applied to the DVD digital camcorder (henceforth a DVD video camera) using DVD which can be written in as a recording medium is made into an example and it explains.

[0022]

[About the composition and operation of a DVD video camera]

Drawing 1 is a block diagram for explaining the example of composition of the DVD video camera of this embodiment. In drawing 1 DVD100 is a recording medium with which the DVD video camera of this embodiment is loaded and dynamic image data and still picture information are recorded.

[0023]

The DVD video camera of this embodiment so that it may also mention later it can respond to all of two digital animation formats with DVD format video (DVD Video format) and a DVD video recording format (DVD Video Recording Format).

[0024]

Therefore the DVD video camera of this embodiment DVD with which the DVD video camera concerned was loaded and which can be written in is initialized to DVD format video or a DVD video recording format and it can make it possible to use it according to the directions from a user.

[0025]

The DVD video camera of this embodiment is provided with the following.

As shown in drawing 1 it is the camera part 1.

MPEG encoder 2.

Format formation part 3.

The recording processing part which consists of JPEG encoder 6 and the format conversion part 7 and the buffer memory 4 the writing/read section 5 used at the

time of record and reproduction.

[0026]

The DVD video camera of this embodimentAs shown in drawing 1the selectors 81 and 84 and the JPEG decoder 82It consisted of MPEG decoder 83had the decode part 8 used at the time of reproductionthe codec 91and the digital interface (it is hereafter called digital I/F for short.) 92and has the digital-input/output part 9 which delivers digital data.

[0027]

And it is connected to digital-input/output terminal IOand the digital-input/output part 9 enables it to send and receive digital data among other apparatus through this digital-input/output terminalas shown in drawing 1. It is decoded in the decode part 8and informationincluding the picture information etc. by which D/A conversion was carried outis outputted through analog output terminal OTand it enables it to supply it to external instrumentssuch as a monitor receiving set.

[0028]

The data compression of them is carried out to the data of an MPEG systemand the analog video signal and analog voice signal from an external instrument enable it to record this on DVD100 while they are inputted into MPEG encoder 2 through the input terminal IN and an A/D conversion is carried out here.

[0029]

To the DVD video camera of this embodiment. LCD (Liquid Crystal Display) controller 11 and LCD12 is providedThe picture which the camera part 1 has caughtand the reproduced image by the image data currently recorded on DVD100 are displayed on LCD12and the user enables it to carry out view \*\* of this. Although not illustratedit is also possible to provide the viewfinder for carrying out view \*\* of the picture which the camera part 1 has caught.

[0030]

And it is what controls each part which the control section 20 mentioned above in drawing 1CPU(Central Processing Unit) 21ROM(Read Only Memory)

22RAM(Random Access Memory) 23and the nonvolatile memory 24It is the microcomputer connected and formed through CPU bus 26.

[0031]

Here the data which needs ROM21 for various kinds of programs and processings which are made to perform by CPU21 of the control section 20 is recordedand it is mainly used [ store / in the middle of processing / RAM22 / temporarily / a result ] as workspace. The nonvolatile memory 24 is for being able to hold memory informationeven if a power supply is droppedand carrying out the hold stores of the result etc. various setting parameters and while liking to hold certainly.

[0032]

The key operation section 25 which has various operation keysoperation knobsetc. is connected to the control section 20. It enables it to input a user's various indicating inputs to the DVD video camera concerned through this key operation section 25. And the information according to the indicating input from a user received through the key operation section 25 is supplied to the control section 20 as an electrical signal. The control section 20 controls each part according to the directions from a userand enables it to perform operation according to the directions from a user of the DVD video camera concerned by this.

[0033]

[About the operation at the time of record of video]

And the DVD video camera of this embodiment can photo a picture as a still pictureand can record it on DVD while it can photo a picture as video and can record it on DVD so that it may explain below.

[0034]

That iswhile the camera part 1 of the DVD video camera of this embodiment is provided with CCD (Charge Coupled Device)it is made to also have electronic formula shutter functions. And the user of the DVD video camera of this embodimentOperate the predetermined operation key of the key operation

section 25 and the DVD video camera of this embodiment is made into the standby state which is in the state which can start photography always. By operating the photographing start key (REC key) of the key operation section 25, the picture which the camera part 1 has caught is photoed as video and operation which records this on DVD100 is performed.

[0035]

In this case, the dynamic image signal from the camera part 1 is supplied to MPEG encoder 2 and after an A/D conversion is carried out here and considered as digital dynamic image data, the data compression of it is carried out with an MPEG system and it is supplied to the format formation part 3. The format formation part 3 forms the data for record according to the recording format (digital animation format) of DVD100 with which the DVD video camera of this embodiment is loaded according to control of the control section 20 and supplies this to the buffer memory 4.

[0036]

In [ as for the buffer memory 4 its writing/read-out is controlled by the control section 20 and ] the time of record, it is for performing time-axis amendment about the data for record between the DVD video camera of this embodiment and DVD100 not leaking and recording all the data for record on DVD100.

[0037]

And in [ the buffer memory 4 is used by a FIFO (First In First Out) method and ] the time of record of video. The data for record from the format formation part 3 is written in the buffer memory 4 one by one, the data for record already simultaneously recorded on the buffer memory 4 is read and writing / read section 5 is supplied.

[0038]

Although writing / read section 5 does not illustrate, it is provided with an optical pickup, a dual shaft actuator, a thread motor, etc. and records the data for record on the position of DVD100 with which the DVD video camera of this embodiment was loaded by control of the control section 20. Thus, the DVD video camera of

this embodiment can record the video photoed through the camera part 1 as digital data to DVD100 which is the recording medium with which this was loaded.  
[0039]

[About the operation at the time of record of a still picture]

The DVD video camera of this embodimentBy making the DVD video camera of this embodiment into a standby stateand operating the shutter key of the key operation section 25the electronic formula shutter of the camera part 1 operates the picture which the camera part 1 has caught is photoed as a still pictureand operation which records this on DVD100 is performed.

[0040]

In this caseafter the still picture signal from the camera part 1 is supplied to JPEG encoder 6and an A/D conversion is carried out here and considered as digital still picture informationa data compression is carried out with a JPEG systemand the data for record of a JPEG format (digital still picture format) is formed. The data for record from JPEG encoder 6 is supplied to writing / read section 5 through the buffer memory 4and is recorded on DVD100 with which the DVD video camera concerned is loaded as still picture information through this writing / read section 5.

[0041]

Thusin the DVD video camera of this embodimentBy recording the dynamic image data of a digital animation formatand the still picture information of a digital still picture format on the proper position on DVD100 which is a recording medium at every photographyIt is intermingled in DVD100 and enables it to record dynamic image data and still picture information. That isthe record section of dynamic image data and the record section of still picture information are divided beforehandand it is made not to provide them on DVD100 which is a recording medium.

[0042]

Thereforefor exampleeven if the storage capacity of DVD is used without futility and it is dynamic image datawithout producing the futility of securing the record

section of still picture information beforehand in spite of not carrying out photography of a still picture. It enables it to record efficiently even if it is still picture information.

[0043]

Thus in the DVD video camera of this embodiment, it is recorded on DVD in a predetermined digital animation format while carrying out the data compression of the video with an MPEG system, and it enables it to record a still picture on DVD100 with which carried out the data compression with the JPEG system, and it was loaded in the digital still picture format.

[0044]

[About the format conversion of still picture information]

It is the timing corresponding [ on the DVD video camera of this embodiment and ] to the directions from a user. To or the timing which the control section 20 judged that there are necessities when making it taken out in DVD100 used for record. All the still picture information currently recorded on DVD100 used for record in the digital still picture format is read, this is changed into the data of a digital animation format, and processing which carries out additional recording to DVD100 is performed.

[0045]

It is specifically the timing according to the directions from a user. Or all the still picture information currently recorded on DVD100 used for record in the digital still picture format is read through writing / read section 5 to the timing which the control section 20 judged that there is necessity, and this is supplied to the format conversion part 7 via the buffer memory 4.

[0046]

The format conversion part 7 changes into the data of the form of I picture of an MPEG system the still picture information (still picture information by which the data compression is carried out by the JPEG method) of the digital still picture format read from DVD100 through writing / read section 5. That is, the format conversion part 7 is what is called a JPEG format I picture converter that

changes the still picture information which cannot be decoded if not based on the decoder of a JPEG system into the data which can be decoded by the decoder of an MPEG system.

[0047]

And in the format conversion part 7 the still picture information changed into the data of the form of I picture of an MPEG system is supplied to the format formation part 3. In the predetermined digital animation format beforehand decided from the data which it is going to record as the format formation part 3 also mentioned above i.e. this embodiment The data for record of DVD format video or a DVD video recording format is formed.

[0048]

If the still picture information made into the form of I picture of an MPEG system from the format conversion part 7 is supplied the format formation part 3 All the still picture information made into the form of I picture of this MPEG system is used as the data (data for one chapter) of 1 settlement and the data for record of a predetermined digital animation format is formed. Thus the formed data for record is recorded on DVD 100 through the buffer 4 and the writing/read section 5 as mentioned above.

[0049]

Thus the DVD video camera of this embodiment For example carry out the data compression of the dynamic image data obtained by taking a photograph with an MPEG system and it is recorded according to a predetermined digital animation format The obtained still picture information is recordable according to a digital still picture format predetermined [such as a JPEG format] by taking a photograph.

[0050]

And further the DVD video camera of this embodiment About the still picture information which carried out digital still picture format record. It changes into the data of I picture format of an MPEG system and as this is added to the dynamic image data which a data compression is carried out with the MPEG system



currently recorded previously and is recorded in the predetermined digital animation format it can be recorded on it.

[0051]

Therefore the still picture information recorded in the digital still picture format changes the still picture information currently further recorded in the digital still picture format into the still picture information in which I picture of the MPEG system held form as it is. He is trying to record on the same recording medium in a digital animation format.

[0052]

If it is playback apparatus provided with the decoder of an MPEG system by this while being able to reproduce and use both the video and still pictures which were photoed with the DVD video camera of this embodiment and were recorded on DVD100 in the digital animation format it enables it to use the still picture information of a digital still picture format in playback apparatus provided with the decoder of a JPEG system without spoiling the resolution.

[0053]

[About regeneration of record data]

The DVD video camera of this embodiment is provided also with the regenerative function which reads the dynamic image data and still picture information which are recorded on this from DVD100 with which the DVD video camera of this embodiment is loaded and is reproduced.

[0054]

And when it is going to reproduce the dynamic image data and still picture information which are recorded on DVD100 with which the DVD video camera of this embodiment was loaded. A user operates the predetermined operation key of the key operation section 25 makes the DVD video camera of this embodiment the reproduction mode which reproduces the data from a recording medium and changes into the state where read-out of data can be performed from DVD100.

[0055]

And in the case of the DVD video camera of this embodiment the control section

20 receives the indicating input of reproduction of dynamic image data and reproduction of still picture information through the key operation section 25.

[0056]

When the received indicating input is the reproduction instruction of dynamic image data, by the control section's 20 controlling writing / read section 5 irradiating DVD100 with a laser beam and receiving the catoptric light, a data compression is carried out with an MPEG system, the dynamic image data currently recorded according to the predetermined digital animation format is read, and the read dynamic image data is supplied to the decode part 8 via the buffer memory 4.

[0057]

Using the buffer memory 4 at the time of reproduction, for example, even if read-out of the record data from DVD100 may break off temporarily by disturbances such as vibration, it is because there is an advantage -- a reproduced image can be made to break off -- by continuing read-out of the data from the buffer memory 4.

[0058]

In the decode part 8, the selectors 81 and 84 are switched to the MPEG decoder 83 side by control of the control section 20. The still picture information currently recorded by I picture format of dynamic image data and an MPEG system is decoded in MPEG decoder 83, the dynamic image data before a data compression and still picture information are restored, and this is reproduced. A reproduced image can be displayed on LCD12 or it enables it to supply external instruments such as a monitor receiving set through output terminal OT.

[0059]

When the received indicating input is the reproduction instruction of still picture information, the control section 20 controls writing / read section 5, and a data compression is carried out by JPEG. The still picture information currently recorded in the digital still picture format is read, the selectors 81 and 84 of the decode part 8 are switched to the JPEG decoder 82 side, and the still picture

information which a data compression is carried out and is recorded with the JPEG system is reproduced.

[0060]

In this case only the still picture information which the data compression was carried out and was recorded with the JPEG system is read and if compared with an MPEG system the still picture of high resolution will be reproduced and it will enable it to be used since it enables it to be decoded and reproduced by the JPEG decoder 82.

[0061]

In the case of dynamic image data a thing such as being made to reproduce a title unit and the video from a title or a chapter which was made to be recorded per chapter and directed is made to be made so that it may also mention later. It enables it to be displayed by what is called slide show display that predetermined-time [every]-displays each of two or more still pictures about the still picture information currently recorded in the form of I picture of an MPEG system.

[0062]

As mentioned above the DVD video camera of this embodiment it also enables it to send and receive digital data such as digital dynamic image data and digital still picture information by having digital-input/output terminal IO and the digital-input/output part 9 for example among external instruments such as a personal computer and a record reproduction machine of DVD.

[0063]

[About the conversion process of the still picture information according to recording format]

Next when the case where available DVD format video is used with the DVD video camera of this embodiment shown in drawing 1 and a DVD video recording format are used it divides The conversion process to the digital animation format of the still picture information recorded in the digital still picture format is explained.

[0064]

[In the case of DVD format video]

First the case where DVD format video is used is explained as a digital animation format. Without dividing that record section beforehand dynamic image data and still picture information are made intermingled and the DVD video camera of this embodiment enables it to record them as mentioned above.

[0065]

Drawing 2 is a figure for explaining the record mode of the data in the case of DVD format video. In the case of DVD format video as shown in drawing 2 (a) the dynamic image data for 1 title which consists of one or more chapters is continuously recorded as VTS (Video Title Set) information.

[0066]

As for the example shown in drawing 2 (a) VTS#1 VTS#2 -- the case where the dynamic image data for n titles is recorded as VTS#n shows are shown. and -- it is the management information of VTS -- every -- VTS information is managed in control and VMG (Video ManaGer) information for a thing such as carrying out continuous reproduction to be made to be made is established without disturbing relation of two or more VTS(s).

[0067]

In the case of DVD format video what is called FAINA rise processing in which it enables it to use the DVD concerned as an object for reproduction is needed by rewriting according to VTS which had the contents of above-mentioned VGM recorded. When DVD format video is used processing which records the still picture information recorded in the digital still picture format also in a digital animation format will be performed by the execution timing of this FAINA rise processing.

[0068]

Namely the timing [ processing / FAINA rise ] according to the directions from a user Processing which records the still picture information which was made to be performed to the timing operated so that DVD might be picked out from the DVD

video camera of this embodiment and was recorded in the digital still picture format at this time also in a digital animation format will be performed.

[0069]

In this specification the word of a title will point out one program if it says by television broadcasting and the word of a chapter points out each portion at the time of dividing the inside of one title like eye eye one curtain [ the first half the second half for ] and 2 curtain and --for example.

[0070]

And he is trying to gather the dynamic image data recorded by the time FAINA rise processing was performed as 1 title for a settlement of 1 title or 99 chapters in the DVD video camera of this embodiment. He is trying to treat the dynamic image data of the video photoed from the REC start before the REC stop as one chapter until photography of an animation is started and the photography is stopped.

[0071]

And when both photography of video and photography of a still picture are performed. The VTS information by which in the case of the DVD video camera of this embodiment dynamic image data is recorded for example as shown in drawing 2 (b) and the still picture information (Wakebe who showed drawing 2 (b) with the slash) by which the data compression was carried out with the JPEG system are intermingled and it is recorded on DVD.

[0072]

Then in the case where received the input of the execution instruction of the FAINA rise processing from a user or extraction of DVD which the DVD video camera concerned is loaded and is used for record is directed as mentioned above etc. As an arrow shows drawing 2 (b) from the still picture information (JPEG still picture information) of the digital still picture format by which the data compression was carried out with the JPEG system. The still picture information made into the form of I picture of an MPEG system is formed (carrying out format conversion processing) two or more [ of these ] (for example 99 sheets) are

collected VTS#n+1 is newly formed as 1 title (carrying out format formation processing) and it records on DVD100 which uses this for record.

[0073]

Then it consists of still picture information made into the form of I picture of the MPEG system of two or more sheets the VMG information also in consideration of newly recorded VTS#n+1 is formed and FAINA rise processing which updates this is performed. By this as shown in drawing 2 (b) to DVD used for record. The dynamic image data which the data compression was carried out with the MPEG system shown by VTS#1 - VTS#n and was recorded by DVD format video it is considered as the form of I picture of the MPEG system shown by VTS#n+1 the still picture information recorded by DVD format video and the still picture information by which the data compression was carried out with the JPEG system are recorded and it enables it to use these each.

[0074]

Of course it is also possible to photo and record only a still picture and in this case as shown in drawing 2 (c) the still picture information (portion shown with the slash in drawing 2 (c)) by which the data compression was carried out with the JPEG system is recorded on DVD. And in the timing of FAINA rise processing from the still picture information by which the data compression was carried out with the JPEG system. As the still picture information made into the form of I picture of an MPEG system is formed it summarizes two or more [ of these ] at a time and it is shown in drawing 2 (c) VTS#1 and -- are newly formed and this is recorded on DVD used for record.

[0075]

And by performing FAINA rise processing and forming and updating VTS#1 newly recorded and the VMG information also in consideration of -- As shown in drawing 2 (c) to DVD used for record. A photograph is taken as a still picture and it is considered as the form of I picture of the MPEG system shown by the still picture information (portion shown with the slash in drawing 2 (c)) by which the data compression was carried out with the JPEG system and VTS#1 The still picture

information recorded by DVD format video is recorded and it enables it to use these.

[0076]

Next JPEG still picture information is changed into I picture of an MPEG system and the data at the time of making I picture after conversion into the title chapter of DVD format video is explained referring to drawing 3. Herein order to explain simply per still picture is made into one chapter three chapters are made into 1 title and the case where it records by DVD format video is made into an example.

[0077]

Drawing 3 is a format figure in DVD format video when the still picture (three chapters) of three sheets is made into 1 title and it records on DVD in the DVD video camera of this embodiment. In drawing 3 (a) before performing processing which makes a still picture a title chapter titles are recorded and signs that the still picture was recorded as the  $n+1$ st titles are shown.

[0078]

In drawing 3 (a) like the case of drawing 2 each VTS (Video Title Set) shows one title and it is shown that  $VTS\#n$  is VTS on which the  $n$ -th title was recorded. And like the case where it explains using drawing 2 (b) in the timing of FAINA rise processing. From JPEG still picture information the still picture information of the form of I picture of an MPEG system is formed two or more sheets (three sheets when it is an example of this drawing 3) are summarized for this  $VTS\#n+1$  is formed and this is recorded on DVD.

[0079]

As shown in drawing 3 (b) in each VTS VTSTT (Video Title Set Information) VTSTT\_VOBS (Video Object Set for Title) and VTSTT\_bup (Video Title Set Information backup) are provided. VTSTT\_VOBS is the image data of each chapter contained in the title and enables it to exist VOB for [ two or more ] a chapter (Video Object) as shown in drawing 3 (c).

[0080]

It is the management information for VTSI managing two or more chapters of each which are made to be recorded on VTSTT\_VOBS and enabling it to read always and VTSI bup is the backup information of VTSI and the contents are the same as VTSI.

[0081]

And original DVD format video is prescribed that two or more CELL(s) can exist into each VOB. However in the DVD video camera of this embodiment As VOB of drawing 3 (c) and CELL of drawing 3 (d) support 1 to 1 Only one CELL is prevented from existing in one VOB of VTS on which the still picture of I picture of the MPEG system formed from JPEG still picture information at least was recorded. That is he is trying to always realize the relation of 1VOB=1CELL=1 chapter.

[0082]

The field called Cell Still Time is in CELL. When CELL is a still picture it can specify the number of seconds which reproduces the CELL (still picture) as Cell Still Time. That is it also enables it to set up arbitrarily the number of reproduction seconds of a still picture (the number of display seconds).

[0083]

In DVD format video although it enables it to also make two or more two or more VOB(s) (Video Object Unit) exist in CELL In the DVD video camera of this embodiment as shown in drawing 3 (e) VOB in CELL of VTS on which the still picture of I picture of the MPEG system formed from JPEG still picture information at least was recorded is restricted to one.

[0084]

In VOB as shown in drawing 3 (e) NV\_PCK (navigation pack) is provided in the head and two or more V\_PCK (video pack) continues continuously. The number of pack (pack) of V\_PCK contained in VOB is the number of packs required for the capacity which can store I picture of one MPEG system. NV\_PCK includes a rapid traverse the data search information for already realizing return etc. etc.

[0085]



Thus in the DVD video camera of this embodiment the still picture information made into the form of I picture of an MPEG system is formed from the still picture information which carried out the data compression and was recorded with the JPEG system. And the still picture of one sheet is made into one chapter the still picture of two or more sheets is packed as 1 title and it enables it to record this on DVD according to DVD format video as shown in drawing 3.

[0086]

It also enables it to adjust changing the regeneration time of the still picture changed into the form of I picture of an MPEG system etc. by changing Cell Still Time of CELL. It enables it to perform a user through the key operation section 25 of the DVD video camera of this embodiment as for this adjustment. In this case it can carry out by rewriting the street data of the information recorded on DVD by control of the control section 20 through writing / read section 5. Of course it is also possible to carry out also in other DVD record reproduction machines provided with the edit function.

[0087]

Next the still picture information by which the data compression was carried out to DVD initialized by DVD format video with the JPEG system is changed into I picture of an MPEG system and the processing in the case of recording this by DVD format video is explained referring to the flow chart of drawing 4.

[0088]

Processing shown in this drawing 4 is performed to the timing which performs FAINA rise processings the case where the execution instruction of the FAINA rise processing from a user occurs at the time of picking out DVD used for record from the DVD video camera concerned etc. for example.

[0089]

When FAINA rise processing is made to perform the control section 20 To drawing 1 the rotation part of DVD which was not illustrated the write-in read section 5 and the buffer memory 4 are controlled The still picture information which a data compression is carried out to DVD 100 used for record with a JPEG system and is

recorded in the digital still picture format is read and this is supplied to the format conversion part 7 (Step S101).

[0090]

And the control section 20 controls the format conversion part 7 changes JPEG still picture information into the data (PS:Program Stream) of the form of I picture of an MPEG system (Step S102) and supplies this to the format formation part 3. The format formation part 3 adds the still picture information made into the form of I picture of the MPEG system supplied to this based on the control from the control section 20 to VTSTT\_VOBS of VTS newly formed in still pictures as shown in drawing 3 It records on DVD through the buffer memory 4 and the writing/read section 5 (Step S103).

[0091]

And it judges that the control section 20 changes into the form of I picture of an MPEG system all the JPEG still picture information currently recorded on DVD used for record and adds it to VTSTT\_VOBS and it was finished whether recording it or not (Step S104). In the judging process of Step S104 when it judges that it has not finished recording the control section 20 controls each part as mentioned above and repeats the processing from Step S101.

[0092]

In the judging process of Step S104 when it judges that the conversion process about all the JPEG still picture information was completed the control section 20 forms VTIS of newly added VTS and records this on DVD through writing / read section 5 (Step S105). It will record in processing of this step S105 setting up the number of reproduction seconds of the still picture changed into Cell Still Time of VTIS at I picture for every still picture.

[0093]

In this case Cell Still Time of VTIS is made into the value for about 3 seconds and is recorded for example. This value is possible also for changing a priori and a user also enables it to change it later as mentioned above.

[0094]

And the control section 20 forms VMG also in consideration of newly because of record of the still picture of an MPEG system added VTSWhat is called FAINA rise processing that records this on the DVD concerned through writing / read section 5 is performed (Step S106)The processing shown in this drawing 4i.e.a JPEG format MPEGI picture conversion processand FAINA rise processing of DVD format video are ended.

[0095]

For examplefor the increase in efficiency of managementetc.in one title (one VTS). When restriction of making it not record a maximum of 99 chapters etc. is providedWhen it judges whether 99 chapters were recorded on the preceding paragraph of the judging process of Step S104 shown in drawing 4 into one VTS and judges that 99 chapters were recordedWhat is necessary is just to make it repeat the processing from Step S101as VISI of the VTS is recorded and VTS is newly formed.

[0096]

That iswhat is necessary is just to form new VTSwhen the number of chapters recordable into 1VTS is counted and the number of chapters recordable into 1VTS is exceeded. Thus the number of chapters recordable on one title (one VTS) can be restricted. Howeverrecording quantity of the still picture information made into the form of I picture of an MPEG system is not restricted by assigning two or more VTS(s) to still picture information.

[0097]

[In the case of a DVD video recording format]

Nextthe case where a DVD video recording format is used is explained as a recording format. The still picture information which the data compression of drawing 5 was carried out with the JPEG systemand was recorded on DVD100 in the digital still picture format is changed into I picture of MPEGIt is a figure for explaining the case where I picture after conversion is recorded on DVD according to a DVD video recording format.

[0098]

In the case of the DVD video camera of this embodimentAs shown in drawing 5 (A)even if it is a case where dynamic image data is recorded in a DVD video recording format to DVD100 used for recordAbout dynamic image datait records according to the DVD video recording formatand separately from dynamic image data about still picture informationa data compression is carried out with a JPEG systemand it records in a digital animation formatand enables it to go.

[0099]

That iseven if it is a case where a DVD video recording format is usedboth dynamic image data and still picture information are made intermingled according to each recording formatand it enables it to be recorded like the case of the DVD format video mentioned above.

[0100]

In drawing 5 (A)the statement of Program#1 is equivalent to VTS#1 in the DVD format video mentioned aboveand shows the portion which constitutes one title. The statement of Cell#1 and Cell#2 is equivalent to CELL in VOB about the dynamic image data in the DVD format video mentioned aboveand corresponds to the chapter which are some dynamic image data (one section) which constitutes one title.

[0101]

Thusthe DVD video camera of this embodimentAbout dynamic image datait records on DVD according to a DVD video recording formatand a data compression is carried out and it enables it to record with a JPEG system separately from dynamic image data about still picture information.

[0102]

And even if it is a case where a DVD video recording format is usedWhen a still picture is photoeda data compression is carried out with a JPEG system and it records on DVD100 in a digital still picture formatJPEG-I picture conversion is performed for the photoed still pictureand he sets the entry point (Entry Point) as the I pictureand is trying to record on DVD100 according to a DVD video recording format. An entry point shows here the position in which the

reproduction start on the stream recorded on DVD is possible.

[0103]

And in recording dynamic image data and still picture information according to the DVD video recording formats shown in drawing 5 (B) it forms PGCI (ProGram Chain Information). In drawing 5 (B) Cell#n in PGCI shows whether it is n-th Cell in PGCI.

[0104]

In Cell in a DVD video recording format. There are two kinds M\_CI (Movie Cell Information) about dynamic image data and S\_CI (StillPicture Cell Information) about still picture information. And in PGCI it is specified that M\_CI and S\_CI can make 999 pieces exist at a time respectively. In the case of this drawing 5 (B) Cell#1 and Cell#2 are M\_CI and Cell#3 is S\_CI.

[0105]

Therefore in the case of drawing 5 (B) two titles (program) of Program#1 and Program#2 are recorded and Program#1 is a title which consists of a chapter of two animations of Cell#1 and Cell#2. Program#2 is the title provided with Cell#3 about still picture information.

[0106]

The pointer to M\_VOBI (Movie VOB Information) shown in drawing 4 C which had the information for accessing the target VOB (Video Object Unit) in M\_CIs as the arrow which connects drawing 4 (B) and drawing 4 C showed there are reproduction starting position ST in the inside of the M\_VOBI reproduction ending position ED and two or more entry point EPs. Here entry point EP which M\_CI has is called M\_C\_EPI (Movie Cell Entry Point Information).

[0107]

M\_C\_EPI which is an entry point which this M\_CI has as an entry point it points to the arbitrary parts of TMAP (Time Map) contained in M\_VOBI and TMAP has a pointer to each VOB in VOB as M\_VOBI of drawing 4 (C) and VOB of drawing 4 (D) were connected by the arrow.

[0108]

It can be made to perform that it directs a playback position by this more finely that it is made to perform reproduction from which scene of the chapter of which title (program) throat etc. according to the directions from a user etc.

[0109]

The pointer to S\_VOBI (Still VOB Information) shown in drawing 4 (C) which had the information for accessing the target VOB (Video Object Unit) in S\_CIA as the arrow connected and showed drawing 4 (B) and drawing 4 (C) there are reproduction starting position ST in the inside of the S\_VOI reproduction ending position ED and two or more entry point EPs. Here entry point EP which S\_CI has is called S\_C\_EPI (Still Picture Cell Entry Point Information).

[0110]

S\_C\_EPI which is an entry point which this S\_CI has As an entry pointer it points to the arbitrary parts of VOB Entries contained in S\_VOI (Still Picture Video Object Group Information) VOB Entries points to arbitrary VOB(s) in a still picture group (Still Picture Video Object Group (Still Group)).

[0111]

As shown in drawing 5 (D) at VOB on which a still picture is recorded one VOB is contained and one I picture is divided into two or more V\_PCK and is stored in VOB. It enables it to exist 64 VOB(s) in one S\_VOI.

[0112]

In the DVD video camera of this embodiment The timing directed by the user about the still picture information which a data compression is carried out to DVD and recorded on it with the JPEG system Or in the timing which the control sections 20 such as timing directed that the DVD concerned is picked out from the DVD video camera of this embodiment judged to be required Change into I picture of an MPEG system and it adds to Still Picture VOB Group shown in drawing 5 (D) in the DVD video recording format which explained this using drawing 5 S\_VOI shown in drawing 5 (C) and Cell (S\_CI) shown in drawing 5 (B) are created creating an entry point according to this.

[0113]

Therefore in the DVD video camera of this embodiment  $64 \times (\text{number of VOB(s)}) = 63936 \times 999 (\text{number of S\_CI}) \times \text{still pictures}$  can be recorded and the record number of sheets of the still picture limited in several minutes (999 sheets) of S\_CI can be increased even the 64 times by making one still picture into one chapter conventionally.

[0114]

Next the still picture information which the data compression was carried out to DVD initialized in the DVD video recording format and was recorded on it with the JPEG system is changed into I picture of an MPEG system. The processing in the case of recording this in a DVD video recording format is explained referring to the flow chart of drawing 5.

[0115]

The processing shown in this drawing 5 like the case where data is recorded by the DVD format video explained using drawing 3. For example it is carried out to the timing which performs what is called FAINA rise processing performed when [ the case where there are directions from a user at the time of picking out DVD used for record from the DVD video camera concerned etc. ] the DVD format video mentioned above is used.

[0116]

In this case the rotation part of DVD which did not illustrate the control section 20 to drawing 1. The write-in read section 5 and the buffer memory 4 are controlled the still picture information which a data compression is carried out to DVD 100 used for record and is recorded on it with the JPEG system is read and this is supplied to the format conversion part 7 (Step S201).

[0117]

And the control section 20 controls the format conversion part 7 changes JPEG still picture information into the data (PS: Program Stream) of the form of I picture of an MPEG system (Step S202) and supplies this to the format formation part 3. Based on the control from the control section 20 as the still picture information made into the form of I picture of the MPEG system supplied to this was

explained using drawing 5 the format formation part 3As it adds to Still Picture VOB Group (drawing 5 (D)) it records on DVD through the buffer memory 4 and the writing/read section 5 (Step S203).

[0118]

And it judges that the control section 20 changes into the form of I picture of an MPEG system all the JPEG still picture information currently recorded on DVD used for record and adds it to Still Picture VOB Group and it was finished whether recording it or not (Step S204). In the judging process of Step S204 when it judges that it has not finished recording the control section 20 controls each part as mentioned above and repeats the processing from Step S201.

[0119]

When it judges that the conversion process about all the JPEG still picture information was completed in the judging process of Step S204 The control section 20 takes into consideration the contents of newly added Still Picture VOB Group While creating Cell (S\_CI) (drawing 5 (B)) with S\_VOI (drawing 5 (C)) and adding S\_VOI creating an entry point Cell is added to PGCI (Step S205) and the processing shown in this drawing 5 is ended.

[0120]

it is possible to also boil comparatively change of a display order which includes the display order of a still picture video and a still picture by changing PGC and Cell and to perform it simply through the key operation section 25 for example using the edit function of the DVD video camera of this embodiment. Of course by changing PGC and Cell using other DVD record reproduction apparatus provided with the edit function for DVD100 used for record with the DVD video camera of this embodiment it is possible to also boil comparatively change of a display order including the display order of a still picture video and a still picture and to perform it simply.

[0121]

[About the display mode of the picture recorded on DVD]

Next the dynamic image data by which the data compression was carried out with



the MPEG system as mentioned above it is formed from the still picture information by which the data compression was carried out with the JPEG system and the still picture information by which the data compression was carried out with this JPEG system. The display mode of the picture in the case of reproducing dynamic image data and still picture information from DVD in which the still picture information made into the form of I picture of an MPEG system was recorded is explained.

[0122]

In the DVD video camera of this embodiment drawing 7 is a case where the image data currently recorded on DVD with which it was loaded is reproduced and is a figure for explaining the display example of the screen in the case of choosing the target image data.

[0123]

It enables it to choose whether a still picture is reproduced or whether video is reproduced in the DVD video camera of this embodiment in drawing 7 as shown in menu item MN1 and MN2. And when reproduction of video is chosen the data compression of the DVD video camera of this embodiment is carried out with an MPEG system and it reproduces the dynamic image data currently recorded according to DVD format video or a DVD video recording format.

[0124]

In this case the control section 20 of the DVD video camera of this embodiment as shown in drawing 7 (A) establish six sub screens in LCD 12 and the six sub screen is received. For example the picture of the head of each title (program) (thumbnail) every [ or / to which the still picture information made into the form of I picture of an MPEG system was directed while displaying the video from the head of each title (program) / regeneration time ] -- what is called a slide show display displayed one by one is performed.

[0125]

In the case of this drawing 7 (A) to the sub screen 12 (1) 12 (2) 12 (3) and 12 (4). The case where the slide show display by the still picture information in which the

video from the head of each title was made into the form of I picture of an MPEG system in the sub screen 12 (5) is performed is shown.

[0126]

And by choosing the target title (program)The video from the head of the selected title (program) can be displayedor it enables it to enable it to perform the slide show display by the still picture information made into the form of I picture of an MPEG system to the limit of the display screen of LCD12.

[0127]

In this casethe still picture information made into the form of I picture of an MPEG system is reproducedand it is not necessary to use it at all about the still picture information by which the data compression was carried out with the JPEG system.

[0128]

Thereforeeven if it does not have the JPEG decoderit enables it to use the still picture information made into the form of I picture of an MPEG systemif it is a DVD reproducing machine machine and DVD record reproduction apparatus provided even with the MPEG decoder. That isit enables it to be used through the still picture information from which the still picture information recorded on the DVD concerned was also changed into the recording format with a JPEG system from the first.

[0129]

In the DVD video camera of this embodimentwhen reproduction of a still picture is chosen the DVD video camera of this embodiment reproduces the still picture information which a data compression is carried out and is recorded with the JPEG system.

[0130]

Also in this casethe control section 20 of the DVD video camera of this embodimentAs shown in drawing 7 (B)six sub screens are established in LCD12 and one-sheet the still picture of one sheet by the still picture information by which the data compression was carried out with the JPEG system is displayed

to the six sub screen.

[0131]

That is as shown in drawing 7 (B) the still picture in every [ by the still picture information which a data compression is carried out and is recorded with the JPEG system ] sheet is displayed on each sub screen 12 (1) - each of 12 (6). And the selected still picture information can be displayed with high resolution to the limit of the display screen of LCD12 by choosing the target still picture rather than the still picture by the still picture information made into the form of I picture of an MPEG system.

[0132]

In this case the still picture information by which the data compression was carried out with the JPEG system is reproduced and it is not necessary to use it at all about the image data (dynamic image data and still picture information) by which the data compression was carried out with the MPEG system.

[0133]

Therefore even if it does not have the MPEG decoder it enables it to use the still picture information by which the data compression was carried out with the JPEG system if it is a DVD reproducing machine and DVD record reproduction apparatus provided even with the JPEG decoder.

[0134]

For example in the case of apparatus provided with both the MPEG decoder and the JPEG decoder like the DVD video camera of this embodiment For example the dynamic image data which the data compression was carried out with the MPEG system and was recorded in DVD format video or a DVD video recording format as shown in drawing 8 It enables it to display the picture according to each of the data using each of the still picture information made into the form of I picture of an MPEG system and the still picture information by which the data compression was carried out with the JPEG system.

[0135]

Also in the example shown in drawing 8 the case where the six sub screens G1-

G6 are formed is shown in the display screen G. And a data compression is carried out to the sub screen G1 and G2 with an MPEG system. It is displayed by the picture corresponding to the dynamic image data recorded in DVD format video or a DVD video recording format and to sub screen G3. A slide show indication by the still picture information made into the form of I picture of an MPEG system is given and the picture corresponding to the still picture information by which the data compression was carried out to the sub screen G4, G5 and G6 with the JPEG system is displayed.

[0136]

And when either of sub screen G1 and G2 is chosen. When the video by the selected dynamic image data can be displayed on the full display screen G and sub screen G3 is chosen as it. To the full display screen G the slide show display by the still picture information made into the form of I picture of an MPEG system can be performed.

[0137]

When the sub screen G4, G5 or G6 are chosen the selected still picture information can be displayed with high resolution on the full display screen G rather than the still picture by the still picture information made into the form of I picture of an MPEG system.

[0138]

The case where six sub screens were established in one screen in the case of the display example shown in drawing 7 and drawing 8 was made into the example. However it does not restrict to this. The sub screen of the number according to the size of the display screen is provided a picture is displayed in various modes the target data is chosen the selected data is reproduced and it enables it to be used.

[0139]

Thus in the case of the DVD video camera of this embodiment. Make video and a still picture intermingled and it enables it to be recorded and the still picture information first recorded about still picture information is left as it is is changed

into the data of the same recording format that is the same compression technology as video and it enables it to rerecord it moreover.

[0140]

In this case since still picture information is not recorded in special mode such as Private Packet of MPEG for example it can make it possible to use both dynamic image data and the still picture information recorded as a still picture using a standard decoder (the case of the embodiment mentioned above standard MPEG decoder) without using a decoder for exclusive use.

[0141]

Even if it does not provide the decoder (the case of the embodiment mentioned above JPEG decoder) only for a still picture it can be made to perform use of still picture information. Since the still picture information compressed by the compression format only for still picture information of the book is also left behind it also enables it to be used and use of the still picture information in the high-definition state can also be made to do this.

[0142]

About the still picture information made into the form of I picture of the MPEG system recorded in DVD format video or a DVD video recording format. It is also possible to change the playback position into arbitrary positions and it can also enable it to expand the width of edit by correcting the information on the information and PGCI of VTS or Cell.

[0143]

Namely by changing title numbers a program number a chapter number a cell still time etc. using the edit function of the DVD video camera of this embodiment or other DVD record reproduction apparatus Time to reproduce a still picture within the playback position on an MPEG stream or an MPEG stream etc. can be changed freely and original contents can be created.

[0144]

Although the still picture information made into the form of I picture of an MPEG system was added after VTS of the last of dynamic image data or Program in

the embodiment mentioned above. When not the thing to restrict to this but a DVD video recording format is used as it inserts in the intervals of record data it can record on it.

[0145]

In an above-mentioned embodiment although the case where a JPEG system was used as compression technology of still picture information was made into the example using an MPEG system as compression technology of dynamic image data and being explained it does not restrict to this. It is possible to use various methods as compression technology of dynamic image data even if it is MPEG system such as MPEG 2 and MPEG 4. It is easy to be natural even if it uses the compression technology with the concept of the data which can be treated for other dynamic image data as a still picture like I picture. Also until it says that it may be made to record about still picture information in the DCF format used with the digital camera for example. Nothing. Still picture information can be applied also when recorded by the method without [ even if it uses compression technology other than JPEG. It is easy to be natural and ] bit map format compression.

[0146]

That is even if it is a case where do not limit the compression technology of data can apply this invention when recording dynamic image data and still picture information by a different recording method and a data compression is not performed. This invention can be applied when recording dynamic image data and still picture information by a different recording method.

[0147]

In the control section 20a user can be notified of the number of sheets of a still picture which can be photoed through LCD etc. also in consideration of the data volume of the still picture information recorded in a digital animation format. In this case the quantity of the data recorded in the digital animation format A recorded quantity of data is computed by doubling the quantity of recorded data in a digital still picture format. What is necessary is to compute the record residue

of DVD and just to compute the number of sheets of a still picture which can be photoed in consideration of the data volume of the still picture information rerecorded in a digital animation format based on this residue.

[0148]

When photoing and recording a still picture it is also possible to change resolution for every still picture for example. That is it is also more possible than the resolution of a standard still picture for it to be made to record with high resolution further and for it to be made to make this into the form of I picture of an MPEG system as mentioned above later.

[0149]

In the embodiment mentioned above although DVD was used as a recording medium do not restrict to this and Other optical discs and magneto-optical discs Or this invention is applicable to magnetic disks such as a hard disk and the recorder using semiconductor memory etc. as a recording medium further. Of course this invention is applicable also to the recording device which can use two or more different recording media for example a disk recording medium semiconductor memory etc.

[0150]

It cannot be overemphasized that it is also possible to apply this invention to the mere recording device which is not provided with a camera part.

[0151]

Although explained as what can choose and use DVD format video and a DVD video recording format as a recording format in the embodiment mentioned above Even if it is one of correspondences it is easy to be natural and of course the thing of enabling it to correspond also about the recording format of further others etc. is also made.

[0152]

[Effect of the Invention]

As explained above according to this invention it is recordable in a refreshable mode with various playback apparatus which is not provided with the decoder

only for [ dynamic image data and still picture information ] still picture information.

[0153]

Since it is recordable also in a refreshable mode with high resolution by using the decoder only for still picture information it can make it possible to use the still picture of high resolution about still picture information always if needed.

[Brief Description of the Drawings]

[Drawing 1] It is a block diagram for explaining the recorder by this invention and the DVD video camera in which the 1 embodiment of the record method was applied.

[Drawing 2] It is a figure for explaining the record mode of the data in the case of DVD format video.

[Drawing 3] It is a figure for explaining the record mode of the data in the case of DVD format video.

[Drawing 4] It is a flow chart for explaining the processing in the case of changing still picture information into I picture of an MPEG system and recording this by DVD format video.

[Drawing 5] It is a figure for explaining the record mode of the data in a DVD video recording format.

[Drawing 6] It is a flow chart for explaining the processing in the case of changing still picture information into I picture of an MPEG system and recording this in a DVD video recording format.

[Drawing 7] It is a figure for explaining the display example of the screen in the case of choosing the target image data.

[Drawing 8] It is a figure for explaining the display example of the screen in the case of choosing the target image data.

[Description of Notations]

1 [ -- Buffer memory] -- A camera part  
2 -- An MPEG decoder  
3 -- A format formation part  
4 5 [ -- A decode part  
9 / -- A digital-input/output part  
11 / -- An LCD controller  
12 / -- LCD  
20 / -- A control section  
21 / -- CPU  
22 / -- ROM  
23 / -- RAM  
24



/ -- Nonvolatile memory25 / -- Key operation section ] -- Writing/read section6 -- A JPEG encoder7 -- A format conversion part8

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1]It is a block diagram for explaining the recorder by this inventionand the DVD video camera in which the 1 embodiment of the record method was applied.

[Drawing 2]It is a figure for explaining the record mode of the data in the case of DVD format video.

[Drawing 3]It is a figure for explaining the record mode of the data in the case of DVD format video.

[Drawing 4]It is a flow chart for explaining the processing in the case of changing still picture information into I picture of an MPEG systemand recording this by DVD format video.

[Drawing 5]It is a figure for explaining the record mode of the data in a DVD video recording format.

[Drawing 6]It is a flow chart for explaining the processing in the case of changing still picture information into I picture of an MPEG systemand recording this in a DVD video recording format.

[Drawing 7]It is a figure for explaining the display example of the screen in the case of choosing the target image data.

[Drawing 8]It is a figure for explaining the display example of the screen in the case of choosing the target image data.

[Description of Notations]

1 [ -- Buffer memory] -- A camera part2 -- An MPEG decoder3 -- A format formation part4 5 [ -- A decode part9 / -- A digital-input/output part11 / -- An LCD controller12 / -- LCD20 / -- A control section21 / -- CPU22 / -- ROM23 / -- RAM24

/ -- Nonvolatile memory25 / -- Key operation section ] -- Writing/read section6 -- A  
JPEG encoder7 -- A format conversion part8

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